

**Amendments to the Claims:**

The listing of present claims in the application:

**Listing of Claims:**

1. (currently amended) A minimum signature solid propellant formulation comprising:  
about 6.0 to about 9.0 weight % of at least one polymeric binder, wherein said binder includes polycaprolactone;  
about 21 to about 25 weight % of at least one energetic plasticizer; and  
about 55 to about 65 weight % of neat ammonium dinitramide having a particle size of about 20  $\mu\text{m}$  to about 60  $\mu\text{m}$  as a neat ADN oxidizer.
2. (currently amended) The solid propellant formulation of Claim 1, wherein said binder is further selected from the group consisting of ~~polycaprolactone;~~  
~~poly(diethyleneglycol 4,8-dinitraza undecanoate)~~ poly(diethyleneglycol-4,8-dinitrazaundecanoate) and ~~polyglycidyl nitrate~~ polyglycidyl nitrate.
3. (currently amended) The solid propellant formulation of Claim 1, wherein said [plasticizer] plasticizer is selected from the group consisting of butanetriol trinitrate, trimethylolethane trinitrate, ~~n-n-butyl-N-(2-nitroxyethyl)nitramine~~ n-butyl-N-(2-nitroxyethyl)nitramine and any combination thereof.
4. (previously presented) The solid propellant formulation of Claims 1, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, crosslinker, a burn rate modifier and a bonding agent.
5. (previously presented) The solid propellant formulation of Claim 4, wherein said curative is selected from the group consisting of hexamethylene diisocyanate, m-tetramethylxylene diisocyanate, dimeryl diisocyanate, toluene diisocyanate, polymeric hexamethylene diisocyanate, isophorone diisocyanate, biuret triisocyanate and any combination thereof.
6. (previously presented) The solid propellant formulation of Claim 4, wherein said cure catalyst is selected from the group consisting of triphenyl bismuth triphenyltin chloride, dibutyltin diacetate and dibutyltin dilaurate.
7. (previously presented) The solid propellant formulation of Claim 4, wherein said stabilizer is selected from the group consisting of N-methyl-p-nitroaniline and 2-NDPA (2-nitrodiphenylamine).

8. (previously presented) The solid propellant formulation of Claim 4, wherein said burn rate modifier is carbon black.
9. (previously presented) The solid propellant formulation of Claim 4, wherein said crosslinker is nitrocellulose.
10. (previously presented) The solid propellant formulation of Claim 1, wherein said solid propellant further comprises at one member selected from ammonium dinitramide prills and CL-20.
11. (withdrawn) A minimum signature solid propellant formulation comprising:
  - about 6.0 to about 9.0 weight % of at least one polymeric binder; about 21 to about 28 weight % of at least one energetic plasticizer;
  - about 17 to about 25 weight % of neat ammonium dinitramide having a particle size of about 20  $\mu\text{m}$  to about 60  $\mu\text{m}$  as a neat ADN oxidizer; and
  - about 35 to about 45 weight % of ammonium dinitramide prills having a particle size of about 100  $\mu\text{m}$  to about 200  $\mu\text{m}$  as an ADN prills oxidizer.
12. (withdrawn) The solid propellant formulation of Claim 11, wherein said binder is selected from the group consisting of polycaprolactone and poly(diethyleneglycol-4,8-dinitraza undecanate).
13. (withdrawn) The solid propellant formulation of Claim 11, wherein said plasticizer is selected from the group consisting of butanetriol trinitrate, trimethylolethane trinitrate, n-n-butyl-N-(2-nitroxyethyl)nitramine and any combination thereof.
14. (withdrawn) The solid propellant formulation of Claims 11, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, a crosslinker, a burn rate modifier and a bonding agent.
15. (withdrawn) The solid propellant formulation of Claim 14, wherein said curative is selected from the group consisting of hexamethylene diisocyanate, m-tetramethylxylene diisocyanate, dimeryl diisocyanate, toluene diisocyanate, polymeric hexamethylene diisocyanate, isophorone diisocyanate, biuret triisocyanate and any combination thereof.
16. (withdrawn) The solid propellant formulation of Claim 14, wherein said cure catalyst is selected from the group consisting of triphenyl bismuth triphenyltin chloride, dibutyltin diacetate and dibutyltin dilaurate.

17. (withdrawn) The solid propellant formulation of Claim 14, wherein said stabilizer is selected from the group consisting of N-methyl-p-nitroaniline and 2-NDPA (2-nitrodiphenylamine).
18. (withdrawn) The solid propellant formulation of Claim 14, wherein said burn rate modifier is carbon black.
19. (withdrawn) The solid propellant formulation of Claim 14, wherein said crosslinker is nitrocellulose.
20. (withdrawn) The solid propellant formulation of Claim 11, wherein said solid propellant further comprises CL-20.
21. (withdrawn) A minimum signature solid propellant formulation comprising:
  - about 6.0 to about 9.0 weight % of at least one polymeric binder;
  - about 21 to about 25 weight % of at least one energetic plasticizer;
  - about 25 to about 45 weight % of ammonium dinitramide prills having a particle size of about 100  $\mu\text{m}$  to about 200  $\mu\text{m}$  as an ADN prills oxidizer; and
  - about 15 to about 25 weight % of CL-20.
22. (withdrawn) The solid propellant formulation of Claim 21, wherein said CL-20 has a particle size of about 3  $\mu\text{m}$ .
23. (withdrawn) The solid propellant formulation of Claim 21, wherein said binder is selected from the group consisting of polycaprolactone, poly(diethyleneglycol-4,8-dinitraza undecanate) and polyglycidal nitrate.
24. (withdrawn) The solid propellant formulation of Claim 21, wherein said plasticizer is selected from the group consisting of butanetriol trinitrate, trimethylolethane trinitrate, n-n-butyl-N-(2-nitroxyethyl)nitramine and any combination thereof.
25. (withdrawn) The solid propellant formulation of Claims 21, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, crosslinker, a burn rate modifier and a bonding agent.
26. (withdrawn) The solid propellant formulation of Claim 25, wherein said curative is selected from the group consisting of hexamethylene diisocyanate, m-tetramethylxylene diisocyanate, dimeryl diisocyanate, toluene diisocyanate, polymeric hexamethylene diisocyanate, isophorone diisocyanate, biuret triisocyanate and any combination thereof.

27. (withdrawn) The solid propellant formulation of Claim 25, wherein said cure catalyst is selected from the group consisting of triphenyl bismuth triphenyltin chloride, dibutyltin diacetate and dibutyltin dilaurate.
28. (withdrawn) The solid propellant formulation of Claim 25, wherein said stabilizer is selected from the group consisting of N-methyl-p-nitroaniline and 2-NDPA (2-nitrodiphenylamine).
29. (withdrawn) The solid propellant formulation of Claim 25, wherein said burn rate modifier is carbon black.
30. (withdrawn) The solid propellant formulation of Claim 25, wherein said crosslinker is nitrocellulose.
31. (withdrawn) A minimum signature solid propellant formulation comprising:
  - about 6.0 to about 9.2 weight % of at least one polymeric binder;
  - about 21 to about 28 weight % of at least one energetic plasticizer; and
  - about 55 to about 68 weight % of neat ammonium dinitramide having a particle size of about 20  $\mu\text{m}$  to about 60  $\mu\text{m}$  as a neat ADN oxidizer.
32. (withdrawn) The solid propellant formulation of Claim 31, wherein said polymeric binder is polycaprolactone.
33. (withdrawn) The solid propellant formulation of Claim 31, wherein said energetic plasticizer comprises:
  - about 4.0 to about 6.0 weight % of butanetriol trinitrate;
  - about 7.0 to about 9.0 weight % of trimethylolethane trinitrate; and
  - about 10.0 to about 13.0 weight % of n-n-butyl-N-(2-nitroxyethyl)nitramine.
34. (withdrawn) The solid propellant formulation of Claim 31, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, crosslinker, a burn rate modifier and a bonding agent.
35. (withdrawn) A minimum signature solid propellant formulation comprising:
  - about 6.0 to about 9.2 weight % of at least one polymeric binder;
  - about 21 to about 28 weight % of at least one energetic plasticizer;
  - about 17 to about 25 weight % of neat ammonium dinitramide having a particle size of about 20  $\mu\text{m}$  to about 60  $\mu\text{m}$  as a neat ADN oxidizer; and
  - about 35 to about 45 weight % of ammonium dinitramide prills having a particle

- size of about 100  $\mu\text{m}$  to about 200  $\mu\text{m}$  as an ADN prills oxidizer.
36. (withdrawn) The solid propellant formulation of Claim 35, wherein said polymeric binder is polycaprolactone.
37. (withdrawn) The solid propellant formulation of Claim 35, wherein said energetic plasticizer comprises:
- about 4.0 to about 6.0 weight % of butanetriol trinitrate;
  - about 7.0 to about 9.0 weight % of trimethylolethane trinitrate; and
  - about 10.0 to about 13.0 weight % of n-n-butyl-N-(2-nitoxyethyl)nitramine.
38. (withdrawn) The solid propellant formulation of Claim 35, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, crosslinker, a burn rate modifier and a bonding agent.
39. (withdrawn) A minimum signature solid propellant formulation comprising:
- about 6.0 to about 9.2 weight % of at least one polymeric binder;
  - about 21 to about 28 weight % of at least one energetic plasticizer;
  - about 35 to about 45 weight % of ammonium dinitramide prills having a particle size of about 100  $\mu\text{m}$  to about 200  $\mu\text{m}$  as an ADN prills oxidizer; and
  - about 15 to about 25 weight % of CL-20.
40. (withdrawn) The solid propellant formulation of Claim 39, wherein said polymeric binder is polycaprolactone.
41. (withdrawn) The solid propellant formulation of Claim 39, wherein said energetic plasticizer comprises:
- about 4.0 to about 6.0 weight % of butanetriol trinitrate;
  - about 7.0 to about 9.0 weight % of trimethylolethane trinitrate; and
  - about 10.0 to about 13.0 weight % of n-n-butyl-N-(2-nitoxyethyl)nitramine.
42. (withdrawn) The solid propellant formulation of Claim 39, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, crosslinker, a burn rate modifier and a bonding agent.
43. (withdrawn) A minimum signature solid propellant formulation comprising:
- about 6.0 to about 9.0 weight % of at least one polymeric binder;
  - about 20 to about 34 weight % of at least one energetic plasticizer; and
  - about 50 to about 65 weight % of neat ammonium dinitramide having a particle

- size of about 20  $\mu\text{m}$  to about 60  $\mu\text{m}$  as a neat ADN oxidizer.
44. (withdrawn) The solid propellant formulation of Claim 43, wherein said polymeric binder is ~~poly(diethyleneglycol-4,8-dinitraza-undecanate)~~ poly(diethyleneglycol-4,8-dinitrazaundecanoate).
45. (withdrawn) The solid propellant formulation of Claim 43, wherein said energetic plasticizer comprises:
- about 5.0 to about 12.0 weight % of butanetriol trinitrate; and
  - about 15.0 to about 22.0 weight % of trimethylolethane trinitrate.
46. (withdrawn) The solid propellant formulation of Claim 43, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, crosslinker, a burn rate modifier and a bonding agent.
47. (withdrawn) A minimum signature solid propellant formulation comprising:
- about 6.0 to about 9.0 weight % of at least one polymeric binder;
  - about 20 to about 34 weight % of at least one energetic plasticizer;
  - about 17 to about 25 weight % of neat ammonium dinitramide having a particle size of about 20  $\mu\text{m}$  to about 60  $\mu\text{m}$  as a neat ADN oxidizer; and
  - about 35 to about 45 weight % of ammonium dinitramide prills having a particle size of about 100  $\mu\text{m}$  to about 200  $\mu\text{m}$  as an ADN prills oxidizer.
48. (withdrawn) The solid propellant formulation of Claim 47, wherein said polymeric binder is poly(diethyleneglycol-4,8-dinitraza undecanate).
49. (withdrawn) The solid propellant formulation of Claim 47, wherein said energetic plasticizer comprises:
- about 5.0 to about 12.0 weight % of butanetriol trinitrate; and
  - about 15.0 to about 22.0 weight % of trimethylolethane trinitrate.
50. (withdrawn) The solid propellant formulation of Claim 47, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, crosslinker, a burn rate modifier and a bonding agent.
51. (withdrawn) A minimum signature solid propellant formulation comprising:
- about 6.0 to about 9.0 weight % of at least one polymeric binder;
  - about 20 to about 34 weight % of at least one energetic plasticizer;
  - about 25 to about 45 weight % of ammonium dinitramide prills having a particle

- size of about 100  $\mu\text{m}$  to about 200  $\mu\text{m}$  as an ADN prills oxidizer; and  
about 15 to about 25 weight % of CL-20.
52. (withdrawn) The solid propellant formulation of Claim 51, wherein said polymeric binder is poly(diethyleneglycol-4,8-dinitraza undeconate).
53. (withdrawn) The solid propellant formulation of Claim 51, wherein said energetic plasticizer comprises:  
about 5.0 to about 12.0 weight % of butanetriol trinitrate; and  
about 15.0 to about 22.0 weight % of trimethylolethane trinitrate.
54. (withdrawn) The solid propellant formulation of Claim 51, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, crosslinker, a burn rate modifier and a bonding agent.
55. (withdrawn) A minimum signature solid propellant formulation comprising:  
about 6.0 to about 10.5 weight % of at least one polymeric binder;  
about 12 to about 32 weight % of at least one energetic plasticizer; and  
about 50 to about 65 weight % of neat ammonium dinitramide having a particle size of about 20  $\mu\text{m}$  to about 60  $\mu\text{m}$  as a neat ADN oxidizer;
56. (withdrawn) The solid propellant formulation of Claim 55, wherein said polymeric binder is polyglycidal nitrate.
57. (withdrawn) The solid propellant formulation of Claim 55, wherein said energetic plasticizer comprises:  
about 0 to about 7.0 weight % of said butanetriol trinitrate;  
about 10.0 to about 15.0 weight % of said trimethylolethane trinitrate; and  
about 2.0 to about 10.0 weight % of said n-n-butyl-N-(2-nitoxethyl)nitramine.
58. (withdrawn) The solid propellant formulation of Claim 55, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, a burn rate catalyst and a bonding agent.
59. (withdrawn) A minimum signature solid propellant formulation comprising:  
about 6.0 to about 10.5 weight % of at least one polymeric binder;  
about 12 to about 32 weight % of at least one energetic plasticizer;  
about 25 to about 45 weight % of ammonium dinitramide prills having a particle size of about 100  $\mu\text{m}$  to about 200  $\mu\text{m}$  as an ADN prills oxidizer; and

about 15 to about 25 weight % of CL-20.

60. (withdrawn) The solid propellant formulation of Claim 59, wherein said polymeric binder is polyglycidal nitrate.
61. (withdrawn) The solid propellant formulation of Claim 59, wherein said energetic plasticizer comprises:
- about 0 to about 7.0 weight % of said butanetriol trinitrate;
  - about 10.0 to about 15.0 weight % of said trimethylolethane trinitrate; and
  - about 2.0 to about 10.0 weight % of said n-n-butyl-N-(2-nitoxylethyl)nitramine.
62. (withdrawn) The solid propellant formulation of Claim 59, further comprising at least one member selected from a curative, a stabilizer, a cure catalyst, a burn rate catalyst and a bonding agent.